

# PATENT ABSTRACTS OF JAPAN

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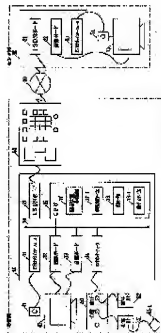
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(54) MEDICAL CARE AT HOME ASSISTANCE SYSTEM

(57)Abstract

PROBLEM TO BE SOLVED: To achieve a measurement of information on living beings in a more comfortable condition without useless uneasiness felt by a patient by arranging a means to judge the mounting of a biological information measuring device on a device on the side of a center or a patient side terminal and a means at the terminal on the side of the patient to notify the mounted state thereof.

SOLUTION: Call is made with TV telephones 40 and 70 to a patient at home from the center side at a fixed time every day to check the condition of the patient and measurement by an electrocardiograph 51 is directed. The patient mounts electrodes 51-1 of the electrocardiograph 51 at specified positions to start a measurement and an electrocardiographic value is transmitted to a mounted state judging section 17 via a sensor interface 14 from a sensor adaptor 50. The mounted state judging section 17 judges whether the electrocardiographic value read is within the range of the maximum value and the minimum value and when it is within the range, the item of music for indicating the normal mounting is performed to notify that the electrocardiograph 51 is mounted normally. When a data reception starting command arrives, the item of music indicating the start of the measurement is performed to inform the patient of the starting of measuring the electrocardiographic value.



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CLAIMS

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[Claim(s)]

[Claim 1] The patient side terminal characterized by comprising the following for a home care supporting system which transmits a patient's biological information which the patient side terminal was connected with a center side apparatus via a means of communication, and was measured to a center side apparatus from the patient side terminal.

A means to judge a mounting state of a biological information measuring device.

A means to report a mounting state to a patient

[Claim 2] A home care supporting system which transmits a patient's biological information which the patient side terminal was connected with a center side apparatus via a means of communication, and was measured to a center side apparatus from the patient side terminal, comprising:

A means by which a center side apparatus judges a mounting state of a biological information measuring device.

A means by which it has a means to report a mounting state to the patient side terminal, and the patient side terminal reports a mounting state notified from a center side apparatus to a patient

[Claim 3] The home care supporting system according to claim 1 or 2 judging a mounting state by analyzing measured biological information.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] The patient side terminal is connected with the center side apparatus with which this invention was installed in a medical institution, a welfare agency, health authorities, etc. via the means of communication.

By transmitting biological information to a center side apparatus from the patient side terminal, it is related with improvement of the home care supporting system with which the specialist who is in the center side performs medical examination, advice, instruction, followup, etc. to a patient

[0002]

[Description of the Prior Art] There are some which were indicated by JP, 7-7560, A as an example of a home care supporting system. The device with which the composition of JP, 7-7560, A measures the biological information of patients, such as a patient's blood pressure, a pulse, electrocardio, to a video telephone terminal is connected.

By transmitting a patient's measured biological information to the hospital side terminal via a transmission and reception means, it is reproduced at the hospital side terminal and examines based on the contents.

[0003]

[Problem(s) to be Solved by the Invention] When measurement of biological information, such as blood pressure and an electrocardiogram, is performed in a hospital, in order that a medical practitioner and a nurse may carry measuring equipment, a patient does not have anxiety to wearing of apparatus. However, when measuring at home, in order for the patient itself to carry measuring equipment, wearing holds the anxiety of \*\*\*\*\* enough. In particular, to measuring equipment, when unfamiliar, the tendency is strong.

[0004] Although judging a mounting state from the measured biological information is also considered, a considerable experience and advanced medical knowledge are needed for

it, for example, the patient itself cannot judge the mounting state of measuring equipment exactly from an electrocardiogram. When transmitting the information to a center, measuring (i.e., when the patient side terminal and a center side apparatus measure in the state where online connection is carried out), Although it is also possible to give the suitable advice about wearing when a medical practitioner etc. supervise the mounting state in a patient with a video telephone system or analyze the biological information transmitted in the center side, The timing which a patient measures, and the timing which both terminals connect are not necessarily in agreement. It measures by closing by the patient side, and there is an example which transmits measurement data to a center by polling from a center side apparatus or the patient side terminal so that it may be represented by regular measurement as such a case.

[0005] Thus, when in the measurement in being home the patient itself has anxiety in wearing of apparatus and faces at measurement, there is a problem that the anxiety influences a measurement result and exact data is not obtained.

[0006]

[Means for Solving the Problem] Insecurity of a patient in an aforementioned problem has happened in order to have to grasp a mounting state of a biological information measuring device for patient itself in the state where there is no clear decision criterion. This invention can measure biological information in the more comfortable state, without a patient holding unnecessary insecurity by reporting a mounting state of a biological information measuring device to a patient, and the center side, such as a hospital, also enables it to perform a suitable medical examination, advice, instruction, followup, etc. based on right biological information.

[0007] That is, by forming a means to judge a mounting state of a biological information measuring device to a center side apparatus or the patient side terminal, and forming a means to report a mounting state in the patient side terminal, a mounting state can be exactly grasped for patient itself, and measurement of right biological information is made easy.

[0008]

[Embodiment of the Invention]

The configuration diagram of the home care system in Example 1 is shown in <Example 1> drawing 1. The patient side terminal 10 is installed in the patient side, the terminal 20 as a center side apparatus is installed in the center side, and terminals are connected via the communication line 30.

[0009] Although the communication line 30 assumes the ISDN circuit, otherwise, a dedicated line, a public line, CATV, radio, etc. may be sufficient as it. The electrocardiograph 51 and the sphygmomanometer 52 are installed in the patient side as a biological information measuring device. In order to hold conversation by the side of a center, the sensor adapter 50 for inputting into the patient side terminal 10 the biological information measured with TV phone 40 and the television camera 41, the telephone 60,

the electrocardiograph 51, or the sphygmomanometer 52 is connected to the patient side terminal 10. In the patient side terminal 10, it is connected by bus 19 and the interfaces 11-15 with each connection device are controlled by CPU16. To CPU16, the mounting state of the electrocardiograph 51 or the sphygmomanometer 52. The mounting state judgment part 17 to judge, The music data table 18-1 in which the data which is needed for the performance of the music table 18 where eye music use it when reporting to a patient the decision value table 17-1 and mounting state the decision value used as the decision criterion of the mounting state judgment part 17 was remembered to be was memorized, and eye music was memorized is carried.

[0010]TV phone 70 and the television camera 71 which hold conversation with a patient are connected to the center side terminal 20. The interfaces 21-23 with a connection device are in the center side terminal 20. The contents of the music table 18 of eye music use it when reporting a mounting state to drawing 6 are shown. A mounting state is expressed with five kinds, "un-equipping", "normal wearing", a "measurement start", "warning", and "measuring finish." "Un-equipping" shows not being normally equipped with biological information measuring devices, such as the electrocardiograph 51, Being correctly equipped with "normal wearing" is shown, it is shown that a "measurement start" starts measurement of biological information after a normal wearing check, it is shown that the abnormalities in wearing generated "warning" after the measurement start, and it is shown that biological information could acquire "measuring finish" correctly and measurement completed it

[0011]A patient selects which music is sounded according to each mounting state, and it registers eye music determined into the music table 18. The music table 18 and the music data table 18-1 of the selected music are sent out from the center side terminal 20 to the patient side terminal 10, and are managed at the patient side terminal 10. The case where an electrocardiogram is measured with the electrocardiograph 51 among biological information measuring devices is mentioned as an example, and [ the biological information and here ] where it measured explain judgment of a mounting state supposing carrying out by analyzing an electrocardio value.

[0012]It shall judge based on the decision value table 17-1 used as the decision criterion of the mounting state judgment part 17, and the contents are shown in drawing 5. In the decision value table 17-1. Maximum 17-1-2 and minimum 17-1-3 which are judged that the measured electrocardio value is normal, If the electrocardio value besides the range of measuring time 17-1-4 equivalent to the data volume of the electrocardio value which should be acquired, maximum 17-1-2, and minimum 17-1-3 is measured how many times, trial maximum 17-1-5 which shows whether it is judged that a mounting state is unusual is managed. Internally, an electrocardio value is changed into the value to 0-255, and is dealt with. Maximum 17-1-2 in the changed value and minimum 17-1-3 are setup. Here, when the range of 32-192 is made into normal values and a value smaller than 32 or a larger value than 192 is measured, it is judged that it is unusual. Measurement of an electrocardio

value is repeated until 300 seconds is set up and measuring time 17-1-4 fills this. Trial maximum 17-1-5 sets up 10 times, and if the abnormal value exceeding this of the number of times is measured, it will consider that wearing is unusual.

[0013] In a remote medical treatment, the telephone call by TV phones 40 and 70 is performed from the center side at fixed time to an in-home patient every day for situation confirmation. Measurement by the electrocardiograph 51 is directed at this time. The patient who received directions attaches the electrode 51-1 of the electrocardiograph 51 to a position, and starts measurement. The measured electrocardio value is sent to the mounting state judgment part 17 via the sensor interface 14 from the sensor adapter 50. [0014] A motion of the mounting state judgment part 17 is explained based on a flow chart (drawing 2, drawing 3, drawing 4). The mounting state judgment part 17 reads each above-mentioned value which serves as a standard of a judgment from the decision value table 17-1 first (Step 101 of drawing 2). The number of times of the present trial for counting the number of times of a trial is set to 0 (step 102 of drawing 2). If initial setting is finished, reading of an electrocardio value will be started (step 103 of drawing 2). The read electrocardio value judges first whether it is within the limits of maximum 17-1-2 and minimum 17-1-3 (step 104 of drawing 2).

[0015] If it is within the limits, music b18-1-3 of "normal wearing" will be performed (Step 105 of drawing 2), and it will report being correctly equipped with the electrocardiograph 51 to a patient. It doubles and a "normal wearing" command is notified to the center side terminal 20 (step 106 of drawing 2). If it is outside the range, the number of times of the present trial will be counted up (step 107 of drawing 2). If the number of times of the present trial is less than five trial maximum 17-1-, an electrocardio value will be re(step 108, 103 of drawing 2) read again. When trial maximum 17-1-5 is exceeded, music a18-1-2 un"equipped" is performed (step 108, 109 of drawing 2), and it reports not being correctly equipped with the electrocardiograph 51 to a patient. It doubles and the command un"equipped" is notified to the center side terminal 20 (Step 110 of drawing 2). A patient repeats said operation until it will check the wearing 51 of an electrocardiograph and music b18-1-3 of "normal wearing" will flow, if music a18-1-2 un"equipped" flows.

[0016] When the "data receiving start" command which notifies what the receiving preparation of the electrocardio value was able to carry out from the center side terminal 20 to the patient side terminal 10 after the "normal wearing" check comes (Step 111 of drawing 3), Music c18-1-4 of a "measurement start" is performed (step 112 of drawing 3), and it tells having started measurement of the electrocardio value to the patient. It doubles, a "measurement start" command is notified to the center side terminal 20 (step 113 of drawing 3), and it tells having started measurement of the electrocardio value from the check of the mounting state.

[0017] If measurement is started, the number of times of the present trial will be returned to 0 (step 114 of drawing 3), and 0 will be set as the effective measuring time which counts measuring time (step 115 of drawing 3). In order to deduce the time which has measured

the normal electrocardio value, current time is evacuated to start time (step 116 of drawing 4), and an electrocardio value is read (step 117 of drawing 4). If the read electrocardio value is within the limits of maximum 17-1-2 and minimum 17-1-3, an electrocardio value will be transmitted to the center side with a normal flag (step 118,119 of drawing 4). By lengthening start time from current time, the time measured normally is computed (step 120 of drawing 4), and it adds to effective measuring time (step 121 of drawing 4). If effective measuring time does not amount to measuring time 17-1-4, it continues measurement of an electrocardio value (step 122,116-122 of drawing 4). If the "end of data receiving" command from the center side does not come even if it amounts to measuring time 17-1-4, measurement of an electrocardio value is continued (step 123,116-123 of drawing 4). If an "end of data receiving" command is notified from the center side, music e18-1-6 of "measuring finish" will be performed, it will report ending measurement of an electrocardio value to a patient, and measurement of the electrocardiograph 51 will be ended (step 124 of drawing 4).

[0018] If the read electrocardio value is outside the range of maximum 17-1-2 and minimum 17-1-3, an electrocardio value will be transmitted to the center side with an abnormality flag (step 118,125 of drawing 4). Measurement of an electrocardio value is repeated until it counts up the number of times of the present trial (step 126 of drawing 4) and amounts to trial maximum 17-1-5 (step 127,116-117 of drawing 4, 125-127). When the number of times of the present trial exceeds trial maximum 17-1-5, music d18-1-5 of "warning" is performed (step 127,128 of drawing 4), and it reports that fault occurred in the mounting state of the electrocardiograph 51 in the middle of measurement to a patient. It doubles and "warning" command is notified to the center side terminal 20 (step 129 of drawing 4). A patient checks wearing of the electrocardiograph 51 and redoes measurement again.

<Example 2> example 2 explains the case where the mounting state of a biological information measuring device is judged at the terminal 20 as a center side apparatus.

[0019] The configuration diagram in Example 2 is shown in drawing 7. Explanation of the portion which is common in the Example 1 is omitted, and explains only a different portion. In Example 2, in order to judge a mounting state by the center side, the mounting state judgment portion and the decision value table 17-1 of the mounting state judgment part 17 are established in the center side terminal 20. The portion which reports a mounting state is provided in the patient side terminal 10 as the mounting state reporting part 19 by performing eye music correspond.

[0020] At the patient side terminal 20, a start of measurement by the electrocardiograph 51 will transmit the measured electrocardio value to the center side terminal 20 via the communication line 30. In the mounting state judgment part 17 of the center side terminal 20, based on the decision value table 17-1, a mounting state is judged from the transmitted electrocardio value like Example 1, and it notifies to the mounting state informing part 19 of the patient side terminal 10. The mounting state reporting part 19 of the patient side terminal 10 performs the music registered into the music table 18 according to the

mounting state notified from the mounting state judgment part 17 of the center side terminal 20, and reports a mounting state to a patient

In explanation of the <other examples> example 1 and Example 2, although the electrocardiograph 51 was mentioned as the example and explained as an example of a biological information measuring device, it can respond with other biological information measuring devices, such as a sphygmomanometer and a blood sugar meter. In that case, the mounting state judgment part 17 and the decision value table 17-1 may be formed for every device, or only the decision value table 17-1 may be formed for every device, and the mounting state judgment part 17 may use in common.

[0021] Although explained supposing judgment of a mounting state also analyzing the measured biological information, and performing it, it is also possible to judge by the result of having judged the mounting state, or to use them together by the sensor etc. which detect a contact state. Although Example 1 explained supposing measuring while a patient has a dialog the center side, it may be made to transmit collectively the biological information which was measured independently and measured after the end of measurement by the patient side. In this case, the measured biological information is not notified to the center side terminal 20 at any time, but it is once stored in the patient side terminal 10, and the directions by the side of fixed time or patient, or a center notify it to the center side terminal 20.

[0022] Do not transmit the measured biological information to the center side terminal 20 at the time of a mounting state check, but in Example 1, after "normal wearing" is checked, transmit to the center side terminal 20 from the time of measurement being started, but The biological information measured from the time of checking the mounting state may be transmitted to the center side terminal 20. In this case, directions of "a data receiving start" and "an end of data receiving" are performed to compensate for a start/end of measurement

[0023] In Example 1, although he is trying to manage the decision value table 17-1 used as the decision criterion of the mounting state judgment part 17 at the patient side terminal 10, the form which carries out central control at the center side terminal 20, and is downloaded and used for the degree of measurement from the center side terminal 20 to the patient side terminal 10 may be sufficient as it. The decision value table 17-1 is not created for every patient, but a mounting state may be judged for all the patients based on the decision value table 17-1 of an identical content. When creating for every patient, according to a patient's characteristic, there is a merit which can judge a mounting state now corresponding to a patient individual's condition by setting up the value of the decision value table 17-1.

[0024] Although it is making into the example for the method of telling a mounting state to perform eye music set up for every mounting state beforehand, and to perform Example 1 and Example 2, To register the message for every mounting state and what is necessary is [ the form where it is passed may be sufficient, in addition ] just an informing means whose



distinction is possible according to states, such as an electronic sound. It may be made to share music data and a message source to the center side, and central control of music data and the message source for every patient may be carried out by the center side.

[0025]

[Effect of the Invention] Measurement of biological information, such as electrocardio and blood pressure, is attained without making a feeling of tension and insecurity unnecessary for the patient side hold by reporting the mounting state of biological information measuring devices, such as an electrocardiograph and a sphygmomanometer, by the above, when measuring biological information while a patient is at home.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The configuration diagram of Example 1

[Drawing 2] The flow chart which shows processing of a mounting state judgment part (1/3)

[Drawing 3] The flow chart which shows processing of a mounting state judgment part (2/3)

[Drawing 4] The flow chart which shows processing of a mounting state judgment part (3/3)

[Drawing 5] The figure showing the contents of the decision value table

[Drawing 6] The figure showing the contents of the music table

[Drawing 7] The configuration diagram of Example 2

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